Semple, J.C. 2018. On *Solidago macvaughii* (Asteraceae: Astereae), a rare Mexican endemic in the *Tortifoliae* group of *Solidago* subsect. *Triplinerviæ*. Phytoneuron 2018-35: 1–6. Published 30 May 2018. ISSN 2153 733X

ON *SOLIDAGO MACVAUGHII* (ASTERACEAE: ASTEREAE), A RARE MEXICAN ENDEMIC OF THE *TORTIFOLIAE* GROUP OF *SOLIDAGO.* SUBSECT. *TRIPLINERVIAE*

JOHN C. SEMPLE
Department of Biology, University of Waterloo
Waterloo, Ontario Canada N2L 3G1
jcsemple@uwaterloo.ca

ABSTRACT

Nesom (1989) described *Solidago macvaughii* based on two collections from Aguascalientes, Mexico, in his paper on *S. velutina* in *Solidago* subsect. *Nemorales.* Based on triple-nerved leaves and lower stem leaves that are wilted, twisted, and persistent, *S. macvaughii* is placed in the informal Tortifoliae group of subsect. *Triplinerviae*, which includes *S. pringlei* and *S. durangensis*, also both endemic to Mexico. Detailed illustrations of the species are presented.

Nesom (1989) described *Solidago macvaughii* Nesom but did not illustrate the new species. He noted that it was similar to *S. velutina* DC. (subsect. *Nemorales* (Mackenzie) Nesom), following McVaugh's identification of it (1984) as that species (by the synonym *S. scabrida* DC.). The holotype of *S. macvaughii* (cited below) was examined as part of a multivariate study of subsect. *Nemorales.* However, close examination of the type indicated it is likely a member of subsect. *Triplinerviae*, based on senesced lower stem leaf traits, which are similar to those of *S. tortifolia* Ell. (Fig. 4; Semple & Cook 2006; Semple 2018, frequently updated). The type includes a ca 98 cm tall shoot with inflorescence and a much smaller vegetative shoot glued underneath the large shoot. The stem of the larger shoot is glabrate near the base, possibly due to hair loss with age (Fig 2A), but becomes densely short-woolly distally (Fig. 2B) in the region bearing multiple senesced lower stem leaves that are brown, pendent, and twisted (Fig. 2E-F). The lower mid to upper stem leaves of the type are similar to those of other species in the *Tortifoliae* group of subsect. *Triplinerviae* and have up to 8–15 small serrations on the lower mid stem leaves (Fig. 2G-J) and 0–1 on the distal stem leaves (Fig. 2K). All leaves have two prominent lateral veins that are visible on even the upper stem leaves, the triple-nerved condition of sect. *Triplinerviae.*

The informal *Tortifoliae* group includes *Solidago altiplanities* C.&J. Taylor, *S. chilensis* Meyen, *S. durangensis* Nesom, *S. juliae* Nesom, *S. leavenworthii* Torr. & A. Gray, *S. microglossa* DC., *S. pringlei*, and *S. tortifolia* (Semple 2018 frequently updated); some collections of nearly all of these species have similar persistent, wilted, twisted, brown to black, lower stem leaves. Such leaves are not characteristic of other species of *Solidago.* There is no specimen of *S. durangensis* with lower stems and leaves. The inner phyllaries of the *S. macvaughii* type are generally narrowly oblong with broad, hyaline, fimbriate margins distally; *S. pringlei* can have similar phyllaries.

Nesom (1989) noted that *Solidago macvaughii* grows in wetter habitats than *S. velutina*, to which he compared it. *Solidago durangensis* also may be native to wetter habitats, or was once, if it is now extinct. Such habitats in Aquascalientes, Durango, and western Zacatecas should be searched to locate more collections of both very rare species.

Nomenclature

Solidago macvaughii Nesom, Phytologia 67: 301. 1989. **TYPE**: **MEXICO**. **Aguascalientes**. [Mpio. Rincón de Romos]: 2 km S and 2 km E of Rincón de Romos; low ungrazed meadow with some permanent wet places, elev. 2000 m, local in patches near road, 4 Sep 1967, *R. McVaugh 23663* (holotype: MICH; Figs 1-3).

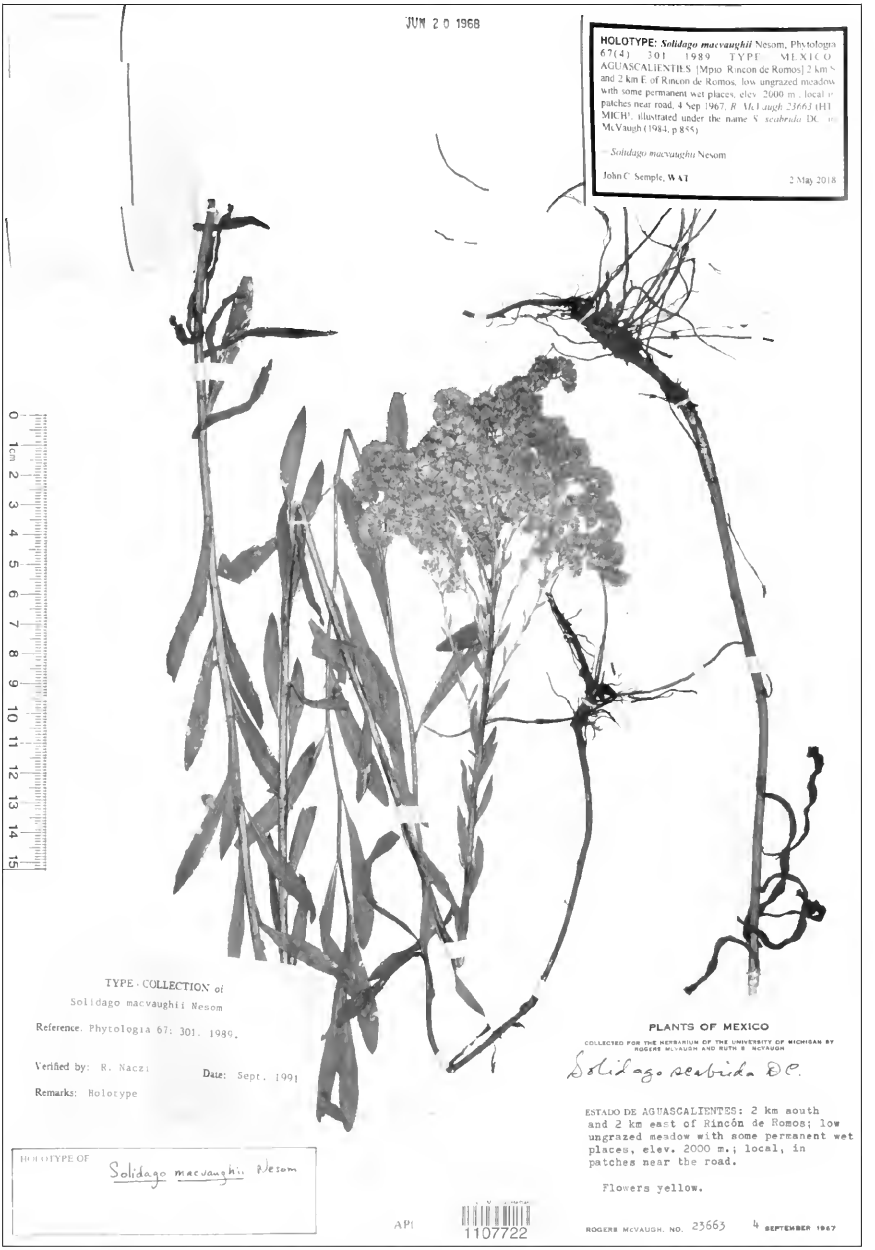

Figure 1. Holotype of *Solidago macvaughii* from Aguascalientes, Mexico.

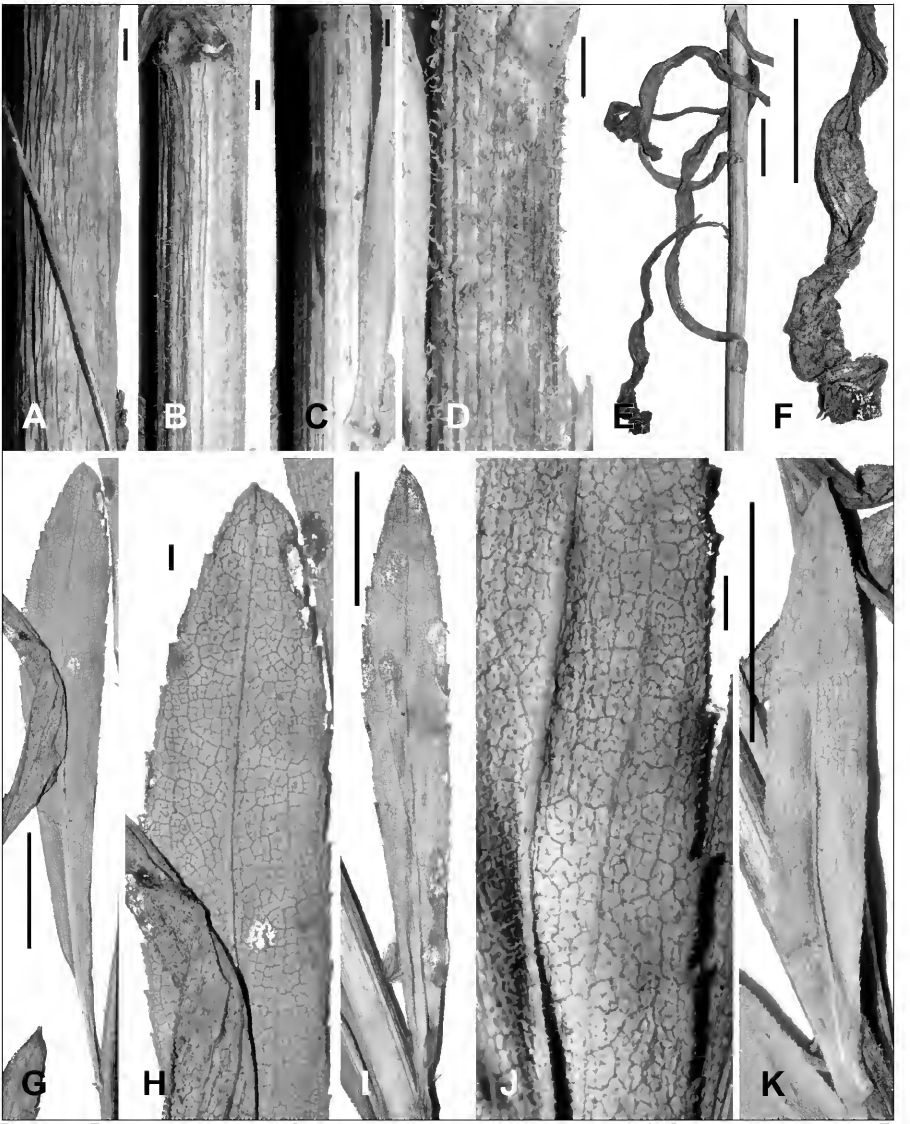

Figure 2. Details of holotype of *Solidago macvaughii*: stems and leaves. **A.** Lower stem near base. **B.** Lower stem with leaves still attached. **C.** Mid stem. **D.** Upper stem. **E-F.** Withered and twisted lower stem leaves. **G-H.** Lower stem leaf of vegetative shoot. **I.** Distal lower stem leaf of large shoot. **J.** Lower mid stem leaf abaxial surface detail. **K.** Upper stem leaf. Scale bar = 1 cm in E-G, I, and K; = 1 mm in A-D, H, and J.

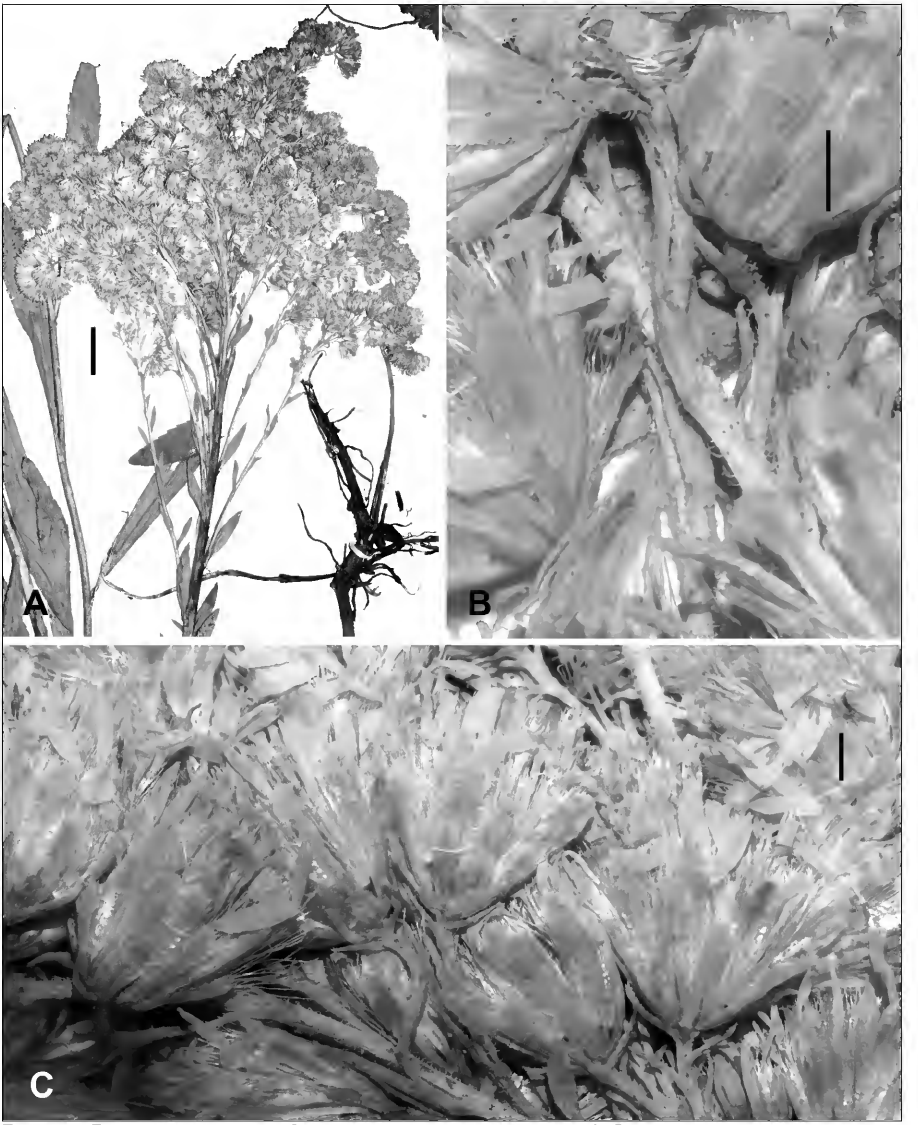

Figure 3. Details of holotype of *Solidago macvaughii*: floral traits. **A.** Inflorescence of 98 cm tall shoot. **B.** Peduncles and bracts. **C.** Heads. Scale bar = 1 cm in A; = 1 mm in B and C.

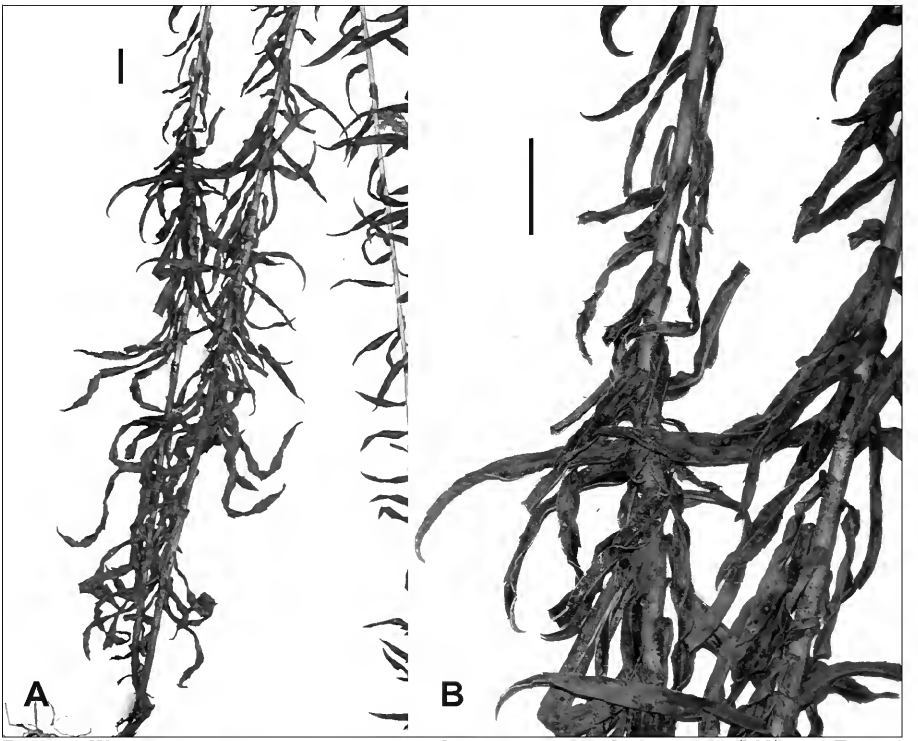

Figure 4. Wilted and twisted lower stem leaves of *Solidago tortifolia, Godfrey 67409* (MO) from Thomas Co., Georgia. **A.** Two lower stems with wilted brown leaves and a portion of a mid stem with green leaves. **B.** Distal lower stem leaves. Scale bars = 1 cm.

Additional collection: **MEXICO**. **Aguascalientes**. Mpio. Asientos, near Cienega Grande, grassy pastured flats along a watercourse, locally abundant, 2000 m, 8 Sep 1967, *McVaugh 23784* (MICH), as cited by Nesom (1989).

ACKNOWLEDGEMENTS

This work was supported by a Natural Sciences and Engineering Research Council of Canada Operating and Discovery Grants to the JCS. Joan Venn is thanked for her curatorial assistance with loans. The following herbaria are thanked for loaning specimens and giving permission to dissect heads of selected specimens: MICH, MO, TEX.

LITERATURE CITED

McVaugh, R. 1984. Flora Novo-Galicia, Vol. 12, Compositae. Univ. of Michigan Press, Ann Arbor.

Nesom, G.L. 1989. Taxonomy of *Solidago velutina* (Asteraceae: Astereae) with a new related species from Mexico. Phytologia 67: 297–303.

Semple, J.C. 2018 (frequently updated and modified). Classification and Illustrations of Goldenrods. <https://uwaterloo.ca/astereae-lab/research/goldenrods/classification-and-illustrations>

Semple, J.C. and R.E. Cook. 2006. *Solidago* Linnaeus. Pp. 107–166, in Flora North America Editorial Committee (eds.). Flora of North America. Vol. 20. Asteraceae, Part 2. Astereae and Senecioneae. Oxford Univ. Press, New York.